# Training Systems Acquisition Two (TSA II) Subcontract Management Plan

**In Response to:**

Solicitation F33657-01-D-2072

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**Submitted by:**

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## Question 401 – Subcontract Management Plan ITO Requirements Traceability Matrix

| Section L Requirement | | Section M Requirement | | Volume II Proposal Reference | |
|---|---|---|---|---|---|
| | Question 401: Page Limit 15 or less<br>NOTE: These questions shall be answered by the information provided in the Subcontract Management Plan. | | The offeror shall provide a Subcontract Management Plan.<br><br>The following item is of special interest: | All | TSA II Subcontract Management Plan |
| | Describe your processes for<br>• selecting,<br>• coordinating with,<br>• integrating and<br>• controlling subcontractors. | | How the offeror uses tools and processes to select and maintain oversight and control of subcontractors and vendors throughout development and fabrication. | 2. | Selecting, Coordinating With, Integrating And Controlling Subcontractors |
| | Describe your lines of communication and authority with subcontractors. | | This section of the subfactor is met when the offeror's Subcontract Management Plan describes the appropriate level of oversight of all work accomplished by subcontractors and vendors including the development and fabrication phases of a program. | 3. | Performance Of Task Orders |
| | Describe your problem resolution process. | | | 4. | Problem Resolution Process |
| | Describe your make/buy decision processes. | | | 5. | Make/buy Decision Processes |
| | Provide a table of proposed subcontractors and the specialties they bring to your team. | | How the offeror provides evidence of recent successful subcontractor and vendor management on a military training system programs. | 6.2 | TSA II Proposed Subcontractors |
| | Provide a list of any signed agreements in effect for accomplishing work on TSA II Task Orders. | | | 6.3 | TSA II List Of Any Signed Agreements In Effect |
| | How are Quality Assurance requirements levied and enforced on subcontractors and vendors? | | | 7. | Subcontractor/Vendor Quality Assurance |
| Site Assessment<br>• Provide data as requested for vendor survey, checklist, and rating criteria. Provide subcontractors and vendors management plan documentation that may include subcontractor/vendor rating, purchasing system tools, and other management system items/data.<br>• Provide as requested procurement packages that are used to solicit and manage vendors and subcontractors.<br>• Provide as requested subcontractor QA plans, vendor quality audit reports, and minutes from quality compliance audits from past or current programs. | | | | | |

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## 1. INTRODUCTION

Lockheed Martin Information Systems (LMIS), as the Training Systems Acquisition Two (TSA II) Prime Contractor, can fulfill all Functional Requirement Document (FRD) requirements. The TSA II program is a critical program to Lockheed Martin Training. The TSA II program is an integral part of the Lockheed Martin objective to be the pre-eminent supplier of training systems to the U.S. Government. Lockheed Martin Training provides the customer with all of the training resources required in a single, virtual enterprise. LMIS is the lead Lockheed Martin Training company for TSA II.

Training nearly 50,000 students per year around the world, Lockheed Martin provides highly experienced and effective instructors. We design the best in courseware and computer-based classroom training, serving the full spectrum of training customers – Air Force, Army, Navy, Marine Corps and Special Operations Forces. From the single operator training station to schoolhouse complexes to world-wide distributed mission training, Lockheed Martin partners with its customers to develop the right training solution – on time and within budget. We provide the maintenance to keep these systems operating and keep the forces we support ready now and for the future. An overview of the major capabilities of Lockheed Martin Training is shown in Figure 1.0-1.

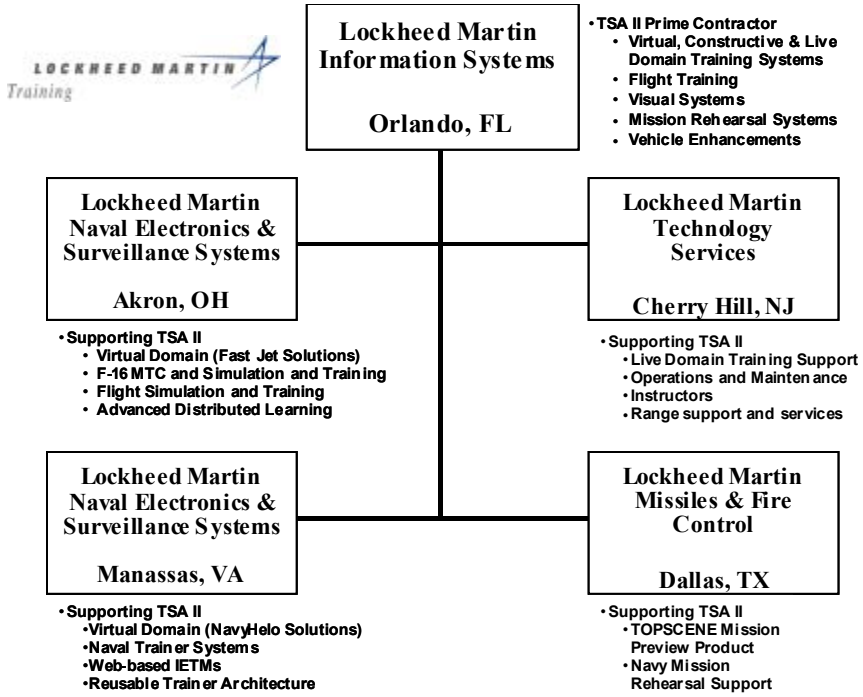


**Figure 1.0-1. An overview of Lockheed Martin Training**

Within Lockheed Martin Training, Jim Keeler, Director Flight Training, is responsible for the TSA II program. Jim reports directly to Nick Ali, the Vice-President of Training and Simulation Solutions. The TSA II program will receive regular, senior level, management focus and attention. Figure 1.0-2 depicts the operations concept for the Simulation and Training Line of Business and the placement of the TSA II program within the Lockheed Martin Training organizational structure.

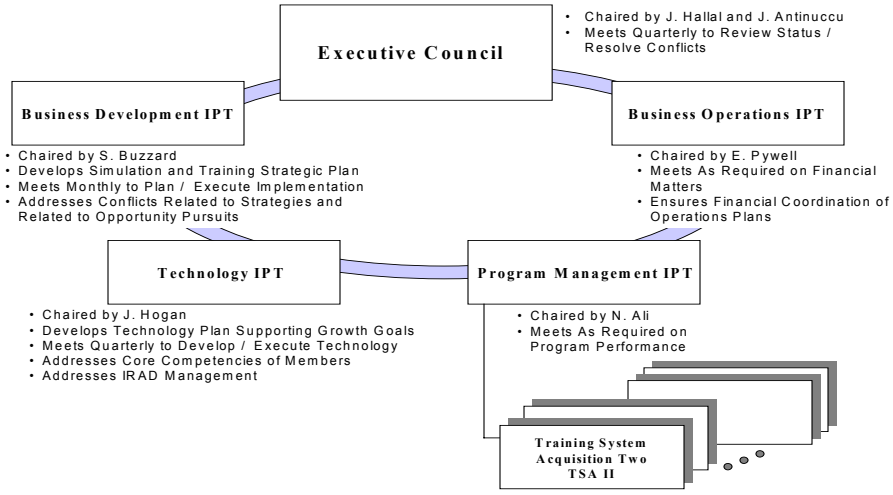


**Figure 1.0-2. Operational Concept for Lockheed Martin Training**

This TSA II Subcontracting Management Plan:

- Describes the Lockheed Martin Training processes for selecting, coordinating with, integrating and controlling subcontractors
- Describes the lines of communication and authority with subcontractors, when applicable
- Describes our problem resolution process.
- Describes our make/buy decision processes.
- Describes how Quality Assurance requirements are levied and enforced on subcontractors and vendors.

## 2. SELECTING, COORDINATING WITH, INTEGRATING AND CONTROLLING SUBCONTRACTORS

Lockheed Martin has a Government-approved procurement system with an established set of procedures that follow the Federal Acquisition Regulation (FAR) and establish the methodology for selecting sources, awarding subcontracts, and monitoring progress to ensure timely task of compliant products. The Vendor/Subcontractor selection process is governed by Lockheed Martin Acquisition Procedures (LMAPs) 2.310 and 2.320, which establish the criteria for competitive and non-competitive sourcing. Lockheed Martin Training also uses other key LMAPs including Evaluating

Suppliers (LMAP 5.320), Reviewing Supplier Ratings (LMAP 5.330), Reviewing Quality System Approvals (LMAP 5.340), and Monitoring Critical Contracts (LMAP 10.310).

Lockheed Martin Training's Sourcing and Supplier Quality Assurance (SQA) performs source selection and subcontractor surveillance and control activities. Lockheed Martin Corporate policy is to use only approved sources for purchase requirements having quality provisions. The supplier selection process is based on the determination of the supplier's capability to provide contractually compliant products and services at a competitive price. This may be determined through the performance of on-site surveys or previous satisfactory quality and task history for the same or similar product. When the requirements of a competitive acquisition are complex and the award is not to be based on price alone, an internal proposal evaluation team may be used. Before a purchase order can be placed, the supplier must be approved for the part number being procured. To be approved for a given part number, a supplier must maintain a minimum quality performance rating of 97 percent. Without this minimum rating, a management exemption from SQA is required.

New suppliers of Group I procurements (as defined by MIL-STD-1535B) or procurements exceeding $500,000 shall be subject to an on-site survey unless quality history within the last year indicates that the supplier is capable of producing material similar to that being procured. The survey team includes representatives, as applicable, from the Engineering, Finance, Manufacturing, Property Control, and Quality departments, and Enterprise Information Systems.

On-site pre-award surveys review contractors' resources and capabilities. The depth of these reviews varies with contract cost and complexity. The pre-award survey involves an assessment of the contractor, including management, organizational, technical, and manufacturing processes and capabilities.

Lockheed Martin Training will fully use the existing organization, procedures, and experienced personnel to develop an efficient and effective subcontract management approach for the TSA II program. Within the existing organizational framework, Lockheed Martin Training will execute the TSA II Subcontract Management Plan. Upon receipt of draft requirements for a task order from the Government, an initial task order Integrated Product Team (IPT) will be assigned responsibility. This IPT will prepare the proposal for the task order and determine the work responsibilities of the respective teammates. This approach allows the efficient translation of requirements to subcontractor's request for proposals (RFPs) to be issued by the sourcing organization.

The IPT will ensure key subcontract performance elements are highlighted as a part of their task order oversight prior submission of the proposal to the Air Force. The IPT will monitor events or accomplishments within them, related to subcontractor performance. In the event that a task order was to be performed entirely or primarily by a subcontractor, Lockheed Martin Training, would

provide direct oversight through the task order Integrated Master Plan (IMP), Integrated Master Schedule (IMS), and key performance metrics that would flow down in the Subcontractor Statement of Work (SSOW).

Requirements flowdown is the process for defining customer requirements and flowing them to subcontractors. This process identifies all technical, contractual, quality, schedule and Mission Success requirements and establishes requirements traceability, validation, and verification from the prime contractor to the subcontractor and suppliers. This will ensure proper monitoring of cost, schedule, and technical performance.

## 3. PERFORMANCE OF TASK ORDERS

### 3.1 Task Order IPT Structure

For small task orders involving a single task or product, the IPT may be a single entity. For large complex task orders involving development or modification of a training system or complex subsystems or devices, multiple product teams are established at tiers below the task order IPT. In this case, the task order IPT will form a Systems Engineering Integration Team (SEIT), including the task order IPT leader, appropriate technical representatives, and a member from each of the lower tier IPT teams. Figure 3.1-1 shows a typical task order IPT for a large complex task order.

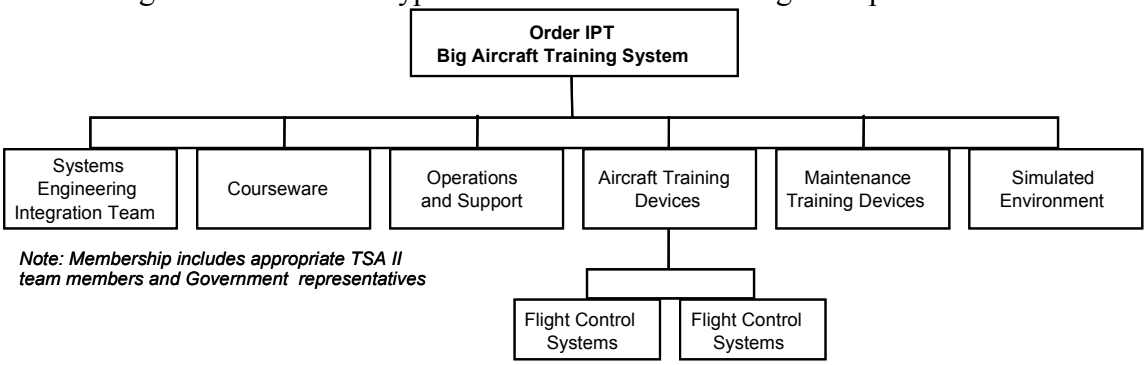


**Figure 3.1-1. Sample Delivery Order IPT Structure**

Each lower-tier integrated product team has membership tailored to that product team's work. Each task order IPT will contain appropriate functional expertise as appropriate to the needs of the task order. Functions involved may include hardware and software engineers, quality assurance engineers, logistics experts, manufacturing specialists, and test engineers. In addition, the team will be advised and assisted by an experienced Lockheed Martin Training subcontract manager, as appropriate to the task order. When required, the task order lead with establish a Subcontract Management Team (SMT) and clearly identify roles and responsibilities of this team with respect to ownership of critical tasks and support responsibilities. Section 3.6 includes a discussion of the Subcontract Program Manager's (SPM) duties.

3.2 Integrated Product Team Responsibilities

Each task order IPT is fully responsible and accountable for performance on that task order. Having developed its own cost, schedule, and performance commitments during the proposal process, the task order IPT is accountable for achieving its commitments to both Lockheed Martin Training and the Customer. The task order IPT leader is empowered to manage performance by all task order IPT members, whether internal Lockheed Martin Training personnel or subcontractors. The task order IPT is responsible for the selection of flow down of requirements to, and monitoring of lower-tier suppliers and vendors. Each lower-tier product team is fully responsible to the task order IPT for all work necessary to meet the cost, schedule, and performance requirements of its product (whether development, production, service, or support). For large task orders the SEIT is responsible for continuing requirements analyses, reallocation if necessary, integration and synthesis of the design or other work, and making appropriate trade-offs to ensure that a fully integrated product that meets all cost, schedule, and performance requirements is delivered to the Customer. Subcontract Program Management will be included on IPTs as required.

3.3 Roles of the Task Order IPT Members

The proposal process used by the task order IPT, described above, ensures that all members of the team understand the requirements and all significant actions necessary to meet those requirements are incorporated in the proposed IMP and IMS. Both during that process and immediately after task order award, each task order IPT member is responsible for using their knowledge of the organization they represent to ensure that all allocated requirements are well within the performing entity's process capabilities. As an integral part of this role, the task order IPT member works closely with the assigned subcontract manager and supplier quality assurance engineer to ensure that the flow down of requirements are clearly understood, measurable, and accurately directed in subcontract task orders or interdivisional work authorizations. Throughout task order performance, each IPT member closely tracks and accurately reports progress and problems, using the IMP and IMS as a baseline. All task order IPT members contribute their knowledge and expertise to improve processes and products, as well as to resolve problems as an integrated team.

3.4 Role of the Task Order IPT Leader

The task order IPT Leader will normally be an employee of Lockheed Martin Training. Selection of the leader is based upon the capabilities and expertise the individual, as well as the management and technical experience. The task order IPT Leader is a true program manager for that task order, empowered by the management with the appropriate authority and responsibility to fulfill that role. The task order leader will ensure that the task order IPT functions as a team, working

closely together whether physically collocated or, if appropriate, as a distributed virtual team relying on continuous electronic communication supplemented by face-to-face meetings as needed. The task order lead closely monitors the progress of all team members and lower-tier subcontractors and suppliers, and tracks all elements of the IMP, IMS and earned value management system output. When task order changes or other events require modification of existing subcontracts or subcontract task orders, the leader works through the assigned Subcontract Program Manager to ensure proper formal contractual actions are promptly executed with the affected subcontractors. The task order leader is the primary interface for reporting progress, problems and plans for resolution, lessons learned and appropriate task order related recommendations to both the Lockheed Martin Training management and to the Customer.

3.5 Task Order Performance Monitoring

As a result of its role in the task order proposal process described above, the task order IPT will already be familiar with the requirements and with the IMP and IMS submitted as part of Lockheed Martin Training's proposal. The Lockheed Martin Training approved Earned Value Management System (EVMS) will be used as the basis for reporting cost and schedule status. TSPG and its customers will have continuing electronic access to the data being used by the task order IPT to manage the task order, but will not be involved in day-to-day management. The Lockheed Martin Training functional staff will provide its expertise to help solve technical, resource, or Customer interface problems when the task order IPT or the Customer requests their assistance, or when the information available to them indicates a need. This Lockheed Martin Training approach to TSA II ensures that the necessary expertise is always available and used when needed, while avoiding costly layering. Most importantly, it retains clear task order IPT "ownership" throughout performance of each task order. Our process fosters continuous improvement by building on the extensive knowledge and experience of the Flight Training staff as they interact with the various task order IPTs. Our managers and senior leadership will cross feed lessons learned to assist the task order IPTs and to continuously improve interactions with the Customer in planning and proposing future task orders.

3.6 Role of the Subcontract Program Manager

As a major proven systems integrator, Lockheed Martin Training has developed extensive subcontract management tools and resources that will be fully employed on TSA II. Lockheed Martin Training has a certified procurement system that will be tailored with program specific operational directives to ensure responsive performance in the TSA II IPT environment. The task order lead will integrate the appropriate level of subcontract management into each IPT. The task order IPT will have broad authority to manage and coordinate all team activities including those of

the subcontractors. The SPM is delegated by and accountable to the IPT lead and is responsible for managing the daily activities of the subcontracted effort. The SPM will maintain the Basic Ordering Agreement, issue supporting RFPs, issue the Subcontractor Statements of Work (SSOW) and implement change proposals as required in support of the task order. If a subcontractor is chosen to lead an IPT, the terms of the subcontract will reflect the subcontractor's task order IPT management responsibility. Furthermore, in this case, the subcontract itself will be overseen a senior SPM.

## 4. Problem Resolution Process

We believe that the Lockheed Martin Training approach to TSA II will prevent most subcontractor problems from occurring. We recognize the additional risk and cost that can be associated with teammates and subcontractors – particularly on an IDIQ contract with a lengthy period of performance. Our approach, based on years of experience and delivering quality products to our customers and the Air Force end user mitigates this risk by focusing the need to subcontract at the task order level rather than at the contract level. However, we do anticipate subcontracting of a case-by-case basis on individual task orders and should problems occur, the Lockheed Martin Training TSA II management is committed to quickly and efficiently resolving any problems that may occur.

Timely and effective communication between task order IPT members, as well as among task order IPTs and Lockheed Martin Training's management team is essential for successful performance. We will archive all deliverables and other significant program documents, including the IMP and IMS, in a task order reference library. The SPM will responsible for controlling changes to the subcontract and for planning and execution of timely subcontract closeout in accordance with corporate and LMIS policy.

### 4.1 Government Insight

The Lockheed Martin Training IPT organization and responsibilities described in this SMP provide a framework for meaningful and timely Government insight into the performance of all task orders. The Training Systems Product Group (TSPG) and its Customers are invited and encouraged to participate as members of our IPTs and to interact with the LMIS staff in Orlando. This may include use of on-sight office space if deemed appropriate by the Government. Through such participation, Government IPT members will have the full benefit of the same information being used by our task order IPTs to manage performance. Key features that support Government insight into the performance of Lockheed Martin Training IPTs on the TSAT II program are discussed in the sections that follow.

4.2 Management Oversight

Management reviews of pre-agreed key events selected from the task order IMP, as well as its reviews of periodic reports of cost and schedule status, offer the opportunity for efficient Government insight. TSPG can obtain insight into progress and problems at the appropriate level and with minimal expenditure of Government personnel resources. Task orders may not warrant significant involvement of Government IPT members.

4.3 Government Membership Access

Government IPT members will have complete access to the same data, whether written or electronic, used by our task order IPTs. They may participate in the Team leader's tracking of the IMP and IMS, IPT meetings and teleconferences, including discussions of problems and proposed resolutions. Such access is subject to TSPG implementation of appropriate restrictions to protect proprietary or competition sensitive data from being released to competing contractors or other inappropriate agencies.

**5. Make/buy Decision Processes**

It is the policy of Lockheed Martin Corporation to provide the best value systems and components obtainable to our customers. In carrying out this policy, Lockheed Martin Training will apply competitive principles in determining make or buy decisions based on the requirements to be satisfied and the optimum combination of performance, schedule, quality and cost factors. Other Lockheed Martin business units are neither advantaged nor disadvantaged as a result of make or buy decisions. All potential suppliers will be afforded the opportunity to be fairly selected. This same principle applies to competitors of Lockheed Martin Training, who are encouraged to pursue buy decisions with Lockheed Martin Training with the full assurance that they will not be competitively disadvantaged. The Lockheed Martin Training make or buy decision process is illustrated in Figure 5.0-1.

Lockheed Martin Training is committed to implementing Make or Buy Decisions that maximize the customer value chain. On the TSA II program, Make or Buy Decisions will be completed for all new task orders and updated during the execution of each task order as required.

Lockheed Martin Training maintains a Make Products Capability List. This list is available with the business area and to other Lockheed Martin business units. This list will be available to the Government subsequent to Contract Award. Make or Buy Decisions result in a Buy List that identifies the products or services to be purchased by Lockheed Martin Training. This Buy list will be the basis for subsequent contracting on the TSA II program.

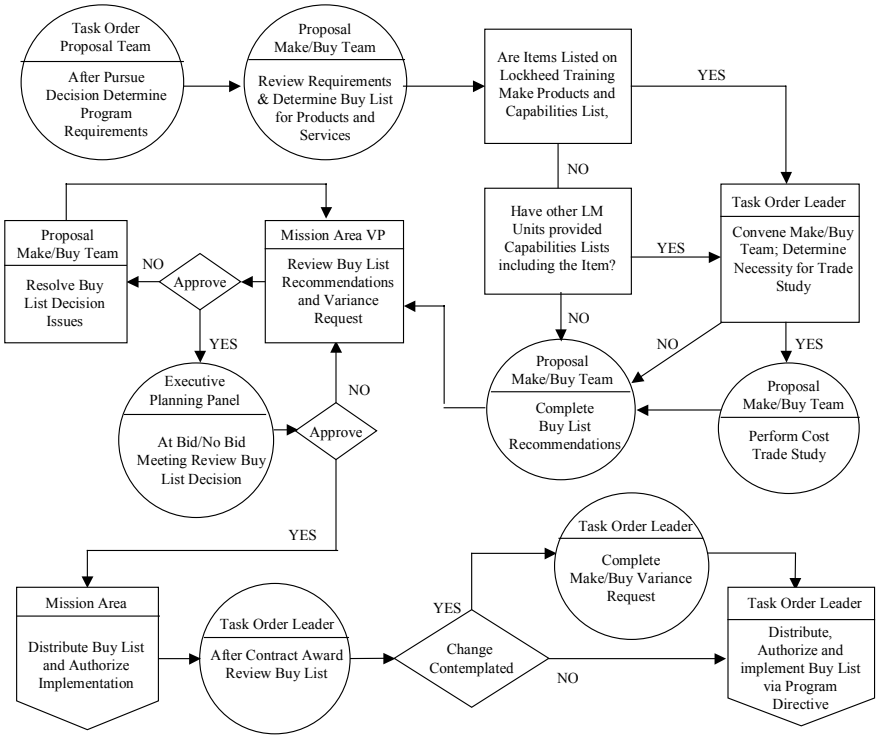


**Figure 5.0-1. The Lockheed Martin Training Buy Make Process**

## 6. Use of Proven Processes

Lockheed Martin Training has established and proven processes and substantial experience in successfully applying those processes to complex training system and other acquisitions. Our Orlando site is certified ISO 9001 as well as CMM Level 4 and SEI Level 4. Over the past several years we have been extremely successful in utilizing our expertise and experience to achieve parallel certifications at individual Main Operating Base (MOB) sites. We will continue this effort on TSA II.

The task order IPT organization and processes, described in this plan, are a tailored application of Lockheed Martin Engineering Process Improvement (EPI) Document 100-08, Integrated Product Development Methodology Handbook, Version 2.0, dated 24 Feb 1997. This is a Corporate-wide preferred practice. Lockheed Martin Training is currently certified under ISO 9001. We require that major subcontractors be either certified under ISO 9001 or equivalent standards. Supplier quality assurance will follow the Lockheed Martin Training Supplier Quality Assurance Procedure Implementation Instructions (SQAP II). Lockheed Martin Training has an approved procurement system and an approved Small Business, Small Disadvantaged Subcontracting plan, as well as a validated earned value management system that will be used in TSA II. .

## 6.1 Recent Successful Subcontractor and Vendor Management

### 6.1.1 ADST-II Program Experience

The ADST II Program was awarded in October 1995 by STRICOM and the use of the IPT concept was immediately implemented and found to be very successful in every aspect of the program. We have found that the IPT concept to be beneficial in the procurement process as follows: (1) The IPT is used to develop SSOWs and specifications. This ensures that the customer's requirements are fully understood and are appropriately represented in each statement of work or specification. (2) The IPT works extremely well in supporting competitive procurements. Lockheed Martin Training and the customer have an opportunity to mutually agree upon the source list and the criteria used to evaluate the competing supplier's proposals. It also provides an open forum to discuss issues and the results of each participant's evaluation so that the source recommended by the IPT is a unanimous selection. This prevents problems with the customer and mitigates risks associated with protests. More recently, Lockheed Martin Training was successfully bid these processes on the U.S. Army Simulation and Training Command (STRICOM) Omnibus Contract, STOC. This IDIQ solicitation included separate competitions in each of four simulation and training domains: Live, Virtual, Constructive and Test and Instrumentation. Over the past five years of the ADST II contract, over 45% ($110M) of the funded delivery order effort was placed with 233 different companies through 700 subcontracts. This reinforces Lockheed Martin Training's commitment to involve the best subcontracted suppliers available to meet the requirements of the respective TSA II task order in coordination with the Government through the IPT process.

### 6.1.2 CCTT Program Experience

The Close Combat Tactical Trainer (CCTT) contract was awarded in November 1992 by the Naval Training Systems Center. The CCTT Integrated Development Team (IDT) allowed Lockheed Martin Training's Program Management Team to realize the full potential of all team members, matching the skills of key managers to program requirements without regard to company affiliation. The CCTT IDT was a seamless integrated team responsible directly to the CCTT Program Manager with each key manager having direct access across company lines within the team.

### 6.1.3 AGTS Program Experience

The Advanced Gunnery Training System contract was awarded June 1994 by STRICOM and has used the IPT process from initiation. The Crew Station/Mobility IPT is responsible for most of the hardware on the contract. It is chaired by a Lockheed Martin Training lead engineer and has key representatives from the STRICOM engineering community and either the program manager or lead engineer from the lead subcontractor that produces the crew stations for the program. The IPT has

been extremely successful in getting the government, prime contractor and subcontractor personnel to operate as a cohesive team to solve design, interface, and specification interface problems. It has allowed all issues to be raised rapidly and solved by the parties with authority. The number of design problems was kept to a minimum and very aggressive development schedules were met. .

6.2 TSA II Proposed Subcontractors

The Lockheed Martin Training TSA II proposal does not include any proposed subcontractors. Lockheed Martin Training as a virtual company within the Lockheed Martin Corporation can draw upon any of the Lockheed Martin business components that satisfy all of the requirements for TSA II as presently defined. Specific subcontractors and vendors will be established as required for each task order. This will be determined as a response to the Government's respective task order RFP and validated in the IPT with the Government after task order award. By not committing work share to subcontractors in advance, the Government has the maximum flexibility in obtaining the best industry supplier as part of Lockheed Martin Training's task order implementation.

6.3 TSA II List Of Any Signed Agreements In Effect

Presently Lockheed Martin Training does not have any signed agreements in effect relevant to TSA II. Should such an agreement be needed for a specific task order, Lockheed Martin Training will establish that agreement during the response to the task order RFP and/or during the execution of the task order.

**7. Subcontractor/Vendor Quality Assurance**

The Lockheed Martin Training Government-approved procurement system with an established set of procedures that follow the Federal Acquisition Regulation (FAR) and establish the methodology for selecting sources, awarding subcontracts, and monitoring progress to ensure timely delivery of compliant products is discussed in Section 2.0 above The Vendor/Subcontractor selection process is governed by LMAPs 2.310 and 2.320, which establish the criteria for competitive and non-competitive sourcing. The Lockheed Martin Training Make Buy processes are discussed in Section 5. Before a purchase order can be placed, the supplier must be approved for the part number being procured. To be approved for a given part number, a supplier must maintain a minimum quality performance rating of 97 percent. Without this minimum rating, a management exception or *override* from SQA is required

Prior to release of the purchase order, the Supplier Quality Assurance Engineer (SQAE) is responsible to review the material requisition (MR), engineering drawing, operations sub-directive (OSD), and any other necessary procurement data. The purpose of this review is to determine the classification of the procurement in accordance with MIL-STD-1535B, quality system certifications,

as applicable, quality text notes, source inspection determination, and design stability. The review of the material requisition assures that an accurate description of the quality requirements and instructions appropriate to the product and/or process being provided is included in the procurement documentation. The quality requirements are then coded and entered into the Consolidated Purchase System (CPS) by the SQAE.

Lockheed Martin Training will ensure that all of its subcontractors and vendors follow the same processes with regard to supplier/subcontractor selection and surveillance. Lockheed Martin Training will fully use the existing organization, procedures, and experienced personnel to develop an efficient and effective subcontract management approach for the TSA II program. Within the existing framework, Lockheed Martin Training will execute the TSA II Subcontract Management Plan on as task order by task order basis. Upon receipt of draft requirements for a task order (task order) from the Government, a task order IPT will be selected. The IPT will be responsible to prepare the proposal for the task order. Following contract award the IPT will determine the work specific responsibilities of the subcontractors when required. This approach will allow the efficient translation of requirements to subcontractor's RFPs issued by the sourcing organization. Each subcontractor RFP includes a SSOW.

The suppliers selected and prices proposed will be reviewed within Lockheed Martin Training, as part of it's the internal review of the task order proposal prior to its submission to the Air Force. The task order IPT will ensure key subcontract performance elements are highlighted during the review process. The IPT, in conjunction with the SPM, will monitor events or accomplishments related to subcontractor performance. In addition, the subcontractor content of critical events will be presented in depth at periodic management reviews to facilitate monitoring supplier performance within the context of overall task order performance. If a task order is being performed entirely or predominantly by a subcontractor, Lockheed Martin Training will provide direct oversight through the task order IMP, IMS, and key performance metrics. This will ensure proper monitoring of cost, schedule, and performance.

7.1 The Lockheed Martin Quality Management System (QMS)

Lockheed Martin has developed an integrated quality assurance program that is ISO-9001 certified. Our QMS is based upon clearly defined policies, procedures, and standards to ensure that contractual requirements are met or exceeded. It defines an integrated approach that ensures a total quality assurance effort with the quality assurance activities being a part of the IPT. Quality Assurance supports the IPT and provides independent assessments to management. Quality Assurance has a project relationship to the program manager, but has a direct reporting relationship to the Information Systems Director of Product Assurance and Manufacturing.

The QMS clearly defines the policies, procedures, evaluations, and audits to be used and performed as part of our total quality program. The program quality engineer (PQE) will be responsible for developing quality input for the IMP, IMS, quality planning activities, including audits, and will be a working member of the IPT. Program quality engineering activities will be integrated with the team to identify quality assurance contract requirements. The PQE will also establish and maintain a design interface with engineering for technical documentation development.

As a member of the IPT, the PQE will help analyze products for safety, reliability and maintainability, and be responsible for verifying the hardware configuration, reviewing the test procedures (clear and complete), and working with the IPT to document any problems during formal testing. Baseline changes will be worked through the Engineering Review Board and will be implemented into the configuration baselines through a formally controlled system. The PQE at each site is responsible for the final internal acceptance of deliverable products as defined in the Lockheed Martin QMS.

The software quality assurance activities will be performed to the IMP, which will include the evaluation of the software products and processes. Our product evaluations are based upon detailed checklists that ensure compliance to contractual requirements and standards. The process evaluations will be performed to ensure that each process in the software development cycle is being followed and any actions items from the process or product evaluations will be tracked in the Quality Evaluation System (QUEST) database. This database allows tracking of evaluations down to the software package and will help to support the IPT in grouping action items that come from both formal and informal reviews. Our process audits are scheduled on a yearly basis so that the customer can participate if desired. In addition to the formal activities related to the support of the IPT, the software quality assurance activities include audits of configuration control, training, and incorporation of customer inputs.

Supplier Quality Assurance is responsible for the quality evaluation of purchased materials including supplier selection, requirements flow down, supplier rating, and assessment and verification either at the supplier or in-house. Our supplier quality program defines the processes that must be performed on commercial-off-the-shelf (COTS) software to ensure the item being purchased meets the defined requirements and is tested to ensure it performs as described. The supplier quality representative will work with all the IPTs to review their needs and ensure that the products identified meet the defined requirements. Any material that is used to support the TSA II program will be formally processed by formal receiving inspection which checks the material to either drawings or the supplier's standards if the item is COTS. Each part and supplier will be tracked to assure the quality of their products.

Test assurance is responsible for integrating hardware and software testing and the final acceptance test of the products. Test assurance assigns a test director to the program to plan, schedule, track, and ensure the performance of the test activities. The test director coordinates the manpower requirements between engineering, test, quality, and the customer and is responsible for conducting the Test Readiness Review (TRR). During testing activity the test director will review the problem report, ensure the regression test is performed, and act as the central point of contact for all testing activities.

7.2 Quality Management System Audits

A key component of the Lockheed Martin Training Quality Assurance audit system is the ISO compliant QMS Audit program. All sections of the QMS manual, which align with the ISO clauses and selected software processes, are covered annually. Independent auditors are drawn from a multifunctional auditor pool. Included in the audit plan is a monthly wildcard audit, allowing for flexibility to react to problem areas, new procedures, etc. Findings are documented in reports to the cognizant management, with Corrective Action Records (CARs) formally issued as warranted. A summary of findings and the audit program status is reported quarterly, at a minimum, to senior Lockheed Martin Training management and Corrective Action Board (CAB) chairmen. Product assurance and manufacturing evaluations and software quality evaluations are other aspects of the quality audit program. These audits are supplemental to, and independent of, the QMS audit program. Audit schedules are developed annually to meet the specific needs to monitor requirements. Software quality evaluations cover both process and product evaluations. Results are reported to the cognizant management. In addition, Product Assurance and Manufacturing, and Supplier Quality Assurance Departments have self-audit programs focused within their own areas to maintain compliance and audit readiness at the detailed level.

The external component of the quality audit system is the Supplier Quality Evaluation. All new suppliers are subject to an on-site survey of quality systems and/or processes. Standardized surveys are used and approved suppliers are tracked in an online system. The material review aspects of the corrective action program are documented in the appropriate on-line nonconformance tracking system in the manufacturing area and SQS in the incoming area) where the person(s) performing the preliminary review enters the information. The program quality engineer or the Material Review Board representative may perform more detailed reviews. When a review indicates a supplier nonconformance, the supplier quality engineer evaluates the nonconformance and provides documentation to the supplier as a Supplier Corrective Action Notice (SCAN) or a Supplier Corrective Action Request (SCAR), which are issued and tracked in the SQS. Data from these nonconformance systems are tracked for trends requiring corrective action and are published on-line.

These data and other metrics are presented at the monthly CABs. CABs provide oversight to the corrective and preventative action activities, and are chaired by the vice presidents and/or directors of the area. Issues not readily resolved, including audit findings, can be recorded as CARs. CARs are assigned, numbered, and tracked for resolution of the problem. Investigation of the problem and corrective action plans are formally documented. Quarterly summaries of CAR and SCAR activities are provided to CAB chairmen. SCARs are issued for a number of situations including repetitive defects (triggered automatically by SQS), for audits, for ongoing deficiencies or trends, for Failure Review Board, Material Review Board, or for Engineering, Manufacturing, Materials, Quality, and Reliability team requests.